CLAIMS:

1. A starting-process controller for starting a piezomotor (4),
- having a voltage-controlled oscillator (1)(VCO), a power output stage (2), and a resonance converter (3), wherein
- the oscillator (1)(VCO) generates the control signals required for the power output stage (2),
- the resonance converter (3) converts the stepped output voltage from the power output stage (2) into a sinusoidal voltage at its output,
- the piezomotor (4) is driven by the sinusoidal voltage from the resonance converter (3),
- the motor current that flows when the piezomotor (4) is driven is measured and compared with the phase of the drive voltage in a phase comparator (6),
- the output signal from the phase comparator (6) is a measure for the phase difference at the time between current and voltage,
- a phase-locked loop filter (8) smoothes the phase-difference signal,
- the smoothed signal controls the oscillator (1)(VCO), and
- a start-assisting circuit element (10) fixes the output voltage from the phase-locked loop filter (8) at start-up and thus applies a constant voltage to the input of the voltage-controlled oscillator (1)(VCO).

2. A starting-process controller as claimed in claim 1, characterized in that the start-assisting element (1) comprises a switching element (10a), a voltage source (U_c), and a resistor (R_c), which items can be switched into parallel with the loop filter (8).

3. A starting-process controller as claimed in claim 2, characterized in that the resistor (R_c) is connected in series with the voltage source (U_c).

4. A starting-process controller as claimed in claim 2, characterized in that the switching element (10a) switches a resistor (R_f) into parallel with the loop filter (8).

5. A starting-process controller as claimed in claim 1, characterized in that the length in time of a signal for activating the switching element (10) is set to a fixed duration from the beginning of start-up.

6. A starting-process controller as claimed in claim 1, characterized in that the activating signal causes the motor (4) to break away.

7. A starting-process controller as claimed in claim 1, characterized in that the activating signal is triggered by the "power-on".

8. A starting-process controller as claimed in claim 1, characterized in that the activating signal is generated by a digital counter or a state machine.

9. A starting-process controller as claimed in claim 1, characterized in that the activating signal is generated by a digital processor.

10. A starting-process controller for starting a piezomotor (4),
- having a voltage-controlled oscillator (1)(VCO), a power output stage (2), and a resonance converter (3), wherein
- the oscillator (1)(VCO) generates the control signals required for the power output stage (2),
- the resonance converter (3) converts the stepped output voltage from the power output stage (2) into a sinusoidal voltage at its output,
- the piezomotor (4) is driven by the sinusoidal voltage from the resonance converter (3),
- the motor current that flows when the piezomotor (4) is driven is measured and compared with the phase of the drive voltage in a phase comparator (6),
- the output signal from the phase comparator (6) is a measure for the phase difference at the time between current and voltage,
- a phase-locked loop filter (8) smoothes the phase-difference signal,
- the smoothed signal controls the oscillator (1)(VCO), and
- an adjustable time-delay element (15) is provided, by which the phase angle between the voltage applied to the motor and the motor current is changed in start-up operation from an initially large starting angle towards a smaller angle at the operating point, so that start-up will be completed safely and reliably irrespective of the loading condition.

11. A starting-process controller as claimed in claim 10, characterized in that the reduction in phase-angle during the start-up process is in the form of a ramp.

12. A starting-process controller as claimed in claim 10, characterized in that the reduction in phase-angle during the start-up process is effected by means of a digital counter (15a).

13. A starting-process controller as claimed in claim 10, characterized in that the starting value of the counter (15a) fixes the phase-angle.

14. A starting-process controller as claimed in claim 12, characterized in that the phase-angle is fixed by the final count reached by the counter (15a).

15. A starting-process controller as claimed in claim 10, characterized in that the start-up process is determined by means of a counter (11a).

16. A starting-process controller as claimed in claim 15, characterized in that counter (11a) counts single or multiple oscillations of the oscillator frequency.

17. A starting-process controller as claimed in claim 15, characterized in that the counter (11a) counts oscillations of a reference frequency forming a clock signal.

18. A starting-process controller as claimed in claim 15, characterized in that the counts made by the counter (11a) are used directly for setting the phase delay.

19. A starting-process controller as claimed in claim 10, characterized in that the counts are converted into the value for setting the phase delay.

20. A starting-process controller as claimed in claim 10, characterized in that the counts are converted into values for setting the phase delay by means of a table (16) in a memory device (RAM or ROM).

21. A starting-process controller as claimed in claim 10, characterized in that the starting process is monitored by a programmable control device such as a microprocessor or a DSP.

22. A starting-process controller as claimed in claim 21, characterized in that the microprocessor monitors the phase delay digitally.